CALFED AERT MEETING - JULY 31, 1996

SUBJECT - Time Value of Water

INTRODUCTION/AGENDA - D. Daniel

purpose and need for time value of water

METHODOLOGY - Russ Brown

presentation of concept and examples

Attendance List:

Dick Daniel - CALFED
Rick Soehren - CALFED
Pete Chadwick - CDFG
Pat Brandes - USFWS
Mike Thabault - USFWS
Roger Guinee - USFWS
Jim Starr - CDFG
Steve Ford - CDWR
Bruce Herbold - EPA
Tom Cannon - CALFED consulting team/Jones and Stokes
Russ Brown - CALFED consulting team/Jones and Stokes
Warren Shaul - CALFED consulting team/Jones and Stokes
Jim White - CDFG
Michelle Wong - CDWR/CALFED
Chris Mobley - NMFS
Eugenia Laychak - CALFED consulting team/CA Center Public Dispute Resolution
Dave Fullerton - CALFED consulting team
Cindy Darling - USBR

SUMMARY OF KEY DISCUSSION POINTS

Method not geared to real-time management; should consider developing general criteria for operations.

Method is too complex. Easier approach would be to negotiate a new hydrograph.

Consider natural hydrograph and unimpaired flows.

Purpose of methodology is unclear.

Greater emphasis need be on an ecosystem approach rather than species approach.

Method should not dilute relationships based on good information with any developed from a poor foundation.

Alleviating risk should be principal value of flow; thus risk should be an important consideration. Ability to deliver water and existing flow frequency should be considered in determining risk. Risk analysis should be used to set weights for months and species.

History of flow should be considered in the value of water at any one time. If flows had been poor and caused depressed populations, why waste additional water.

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Should consider flow effects on habitat including wetlands and riparian vegetation and wildlife.
Weighting among months and species may be difficult.
AFRP recommendations should not represent the ultimate value of flow.
System is too complex and variable to define specific values of water.
Averaging responses to flow will not reflect variability and complexity of system.
A Delphi or BOGSAT approach could be used to set ecological value of water. Results could be compared to a more quantitative approach of setting values.
Methodology would be useful in designating how water dedicated for environmental use or water supply would be released.
Methodology should be written up formally and presented to PCT for comment.
Need to balance between complexity and simplicity.
Method may be useful as a planning tool.
Spreadsheet model provides means of documenting reasoning and assumptions.
Workshops should be held to develop ecosystem time values of water.

DISCUSSION

General Comments on Methodology

1. CM: Concerned that the methodology is not geared to real-time management by operators with criteria for decisions.
2. SF: What about using unimpaired flows somewhere in the equation.
3. CM: Too much emphasis is on target species, not enough on ecosystem approach: habitat, morphology, etc. What about flow effects on wetlands and riparian habitat?
4. BH: Moving water provides opportunities to change ecosystem value. Critical years may be easy. Greatest flexibility is in drier years, because we have so much effect on system; whereas in wet years there is little control or effect from our actions.
5. DF: The focus on flow is too narrow. There are other factors that effect environmental value than operations and screens. Real-time considerations are also important. Can't model real-time. Need guidelines for adaptive management.
6. MT: There should be differential weights by lifestage, as life stages are important considerations.
7. JW: There appears to be double weighting of the months: both in the monthly weighting and in the time values themselves.
8. RG: Using the AFRP flows is OK, except be aware that the recommendations do not necessarily represent the highest values of the water. For example, the 2500 cfs for the fall spawning period on the American River was negotiated based on water availability. The highest value of water probably is 4000 cfs for this period.
9. BH: Risk is important. Some months have higher risks and this should be considered in setting the time value of the water. We should focus on reducing risks to the populations with the release of water. Use risk analysis to set monthly weights.
10. SF: Need to use water frequency and species weights to set monthly weights.
11. DF: It will be hard to hold water if it has already been released in a prior month. Why not save spring releases if previous fall conditions were poor.
12. BH: Need to consider the probability of reaching specific flows as well as the benefit to species

in setting values.

13. CM: There is an easier way to the answer then such a complicated analytic tools as proposed. We are simply looking for some operations guidelines as to whether to hold or release water from storage. Why not simply work from simulated hydrograph showing unimpaired flows and existing flows. Simply negotiate what we want for that month and year type, and then simulate to see if there is sufficient water available.
14. DF: How would we weight across species in that method?
15. MT: Unimpaired flow is good place to start in negotiating a new proposed hydrograph.
16. CD: Value judgements on yield approach is very similar.
17. BH: Natural hydrograph may not be best for species - for example in the upper Sacramento River - the time value depends on what you are trying protect - it also varies from year to year - uncomfortable with either approach - need to focus water value on reducing risk to species.
18. CM: Average approach isn't of much value given high natural variability.
19. CM: How will CALFED use this tool? EIS? Operations management?
20. SF: Purpose appears to be for planning and implementation of restoration program.
21. DD: It is just a planning tool for now.
22. MT: How do we weight among species?
23. CM: Tools allow us to quantify tradeoffs such as weighting between watersheds.
24. DF: Values may be a function of history - previous pattern of flow - what happened last.

Delta Example:

1. MT: Delta smelt vary their location among years - complex. Hard to pin down value of flow and weight among locations for any year or year type. Vulnerability changes. Real-time dependent. Tough to put value of water in a matrix for delta smelt.
2. DD: Behavior of delta smelt may also change with different conveyance options.
3. BH: Habitat area above X2 could be used for delta smelt.
4. CM: Forecasting effect of weather and rainfall is tough in a mechanistic model such as this - wonder if it will be of any value.
5. DF: Stochastic nature of data has relevance in planning. How can we give flexible solutions credit. Average responses and predictions do not give us this capability.
6. CD: Start with average, but consider stochastic variability.
7. SF: We have to be careful with correlations - assuming they represent cause and effect.
8. CM: Start out with a basic assumption, then use adaptive management to test to see if it works. Build the necessary response curves after you to do something.

Sacramento Example:

1. DD: For the Sacramento Time Value we are looking to setting criteria for new storage on the west side of the valley. We want to know the best windows for diverting water from the river near Chico Landing to the reservoir. We want to know when values are least - assume its during high flows, after first peak, and on downward side of peak. Assume flood plain flooding plays a value role in the system.
2. WS: Bypass flooding contributes carbon to estuary.
3. CD: What frequency changes do we invision for bypass flows?
4. CM: Bypasses are indeed important.

5. RG: What validity does this approach have? Does it reflect reality? We would normally use a Delphi or BOGSAT (bunch of guys sitting around a table) to set flow values. Compare this model output to what we have come up with to test how good values are.
6. DD: We will have more flexibility with our water supply with discretionary water for the environment - thus we need a method to help define best use of water - too handle tradeoffs.
7. RG: How is it going to be any different than the CVPIA's 800 TAF of paper water? Will CALFED get real water?
8. CD: Good point since water rights for such water will be junior. Need assurances. Need new institutional guarantees.
9. DD: It will be in storage that is dedicated for this purpose. The Ecosystem Restoration Component will identify specific environmental water. This should help reduce conflicts with water supply.

General Discussion

1. CM: We will still be in their face to maximize environmental benefits of water stored for water supply. We have to consider tradeoffs and instream benefits of water released upstream and designated for diversion to water supply from the Delta.
2. DD: Important - we will be changing the way the water supply system is managed. We will be changing the way the system is operated. We will have new storage and conveyance facilities and designing a new system and operation.
3. CD: I have a deep cynicism.
4. BH: We should have notes from this meeting to discuss at the August 14 PCT meeting.
5. MT: You have only 100 % of habitat if something is there. Geomorphology is an important factor in bypass flow value.
6. SF: Randy Baxter has some information on the amount of habitat available in the bypasses at various flows.
7. CM: Again concerned about the purpose and use of this stuff. What will it be used for? Hypothetical planning purposes? Best guesses? Or a more rigid use? Do not trust the method. Weighting among species is my major concern. Too hard to get agreement on such weights.
8. DD: CALFED is concerned about going to too great a level of detail.
9. PC: Assume we will use these tools to help chose among alternatives.
10. CD: Key assumptions and hypotheses in the approach need agreement before they are accepted.
11. CM: Don't dilute models good relationships and assumptions with uncertain ones. Keep it simple with what is known. Agree that complexity is appropriate with a complex system like this, but the more complex our model is the harder it will be to understand and get agreement on. Need to carefully balance the need for complexity and simplicity.
12. BH: Yes, we don't want uncertainty to drive the process. What will method be used for? Picking alternatives? We should be clear on the use of this method.
13. MT: This may be work well as a planning tool. But it has too many caveats. Help in decisions for management and implementation. It may be too complex for what we need at the programmatic level.
14. CD: Accuracy and precision would have to be teased out of the model to be useful.
15. CM: Every model considers variability. Need to be explicit about assumptions. A risk analysis is a critical aspect that should be included in setting time values of the water.

16. SF: I like a spreadsheet approach to document our conceptual models - helps others understand our assumptions. It provides a good view of the approach and support for decisions. Concerned about timing and CALFED needs for the tool - can we get group buyoff on factors driving the value.
17. CM: We should have workshops to get curves and values. More comfortable with agreeing on factors for management planning. What we think in our heads isn't always accurate.
18. DD: I take it that the approach is OK if we keep it simple, base it on known relationships, focus on natural system and hydrographs, and don't expand beyond our planning needs.
19. BH: Stick with what can you model with credibility rather than "value" curves to support flow recommendations.
20. SF: Tradeoffs among species will be a problem - we have never been able to accomplish this. We need tool for reallocating existing supplies in addition to allocating new environmental water.
21. PB: Providing input on this method is hard. Need a complete description of it before I can provide constructive comment.
22. DD: We will provide a complete concept memo.
23. MT: Curves are better than tables of values.
24. SF: What are you trying to do and by when?
25. DD: Plans and milestones.
26. JW: What will you produce next?
27. RB: Basis for flows and weights will be documented.
28. DD: We will compare with historical flows and unimpaired flows.
29. CD: We need hydrograph charts and flow curves including historical, existing, and proposed like we had for negotiating Carmel River flows.
30. CM: Using AFRP flows wasn't a bad idea. But need to understand how they came up with these numbers.
31. PB: 50's and 60's may not be a good idea for setting targets.